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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/783,002	02/15/2001	Alan F. Graves	12660ROUS02U	6057

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EXAMINER	
CURS, NATHAN M	

ART UNIT	PAPER NUMBER
2633	

DATE MAILED: 11/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/783,002	GRAVES ET AL.	
	Examiner	Art Unit	
	Nathan Curs	2633	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 May 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3 and 10-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3 and 10-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *03 May 2004* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a) because they fail to show "a switch", "three alternating paths", "positive dispersive medium", "negative dispersive medium", and "two band-pass filters" as described in the specification (amendment of 3 May 2004, page 11, lines 7-14). Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-3, 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tshushima et al. (US Patent No. 6424445) in view of Seto (US Patent No. 5937116), and further in view of Fukashiro et al. (US Patent No. 6362905) and further in view of Caspar et al. ("Four-channel 10-Gb/s transmission over 15-wavelength selective crossconnect paths and 1175-km dispersion compensated standard single-mode-fiber links"; Caspar et al.; Photonics Technology Letters, IEEE, Vol 10, Issue 10, Oct 1998, Pages 1479-1480).

Regarding claim 1, Tsushima et al. disclose a photonic network node comprising: means for demultiplexing an optical signal into channels (fig. 16, elements 201); photonic switch fabric (fig. 16, element 123); and means for multiplexing a plurality of channels into an optical signal (fig. 16, elements 202). Tsushima et al. do not disclose means for reducing a variance between inputs to the photonic network node by applying bulk compensation to all channels of the optical signal. Seto disclose a photonic network node comprising: means for demultiplexing an optical signal into a plurality of channels, a photonic switch fabric for forwarding an optical signal comprising a plurality of channels, means for multiplexing a plurality of channels into an optical signal, and means for reducing a variance between inputs of an optical signal received at a photonic node by applying bulk compensation to all channels of the optical signal (fig. 18 and col. 18, line 63 to col. 19, line 13). It would have been obvious to one of ordinary skill in the art at the time of the invention to use bulk compensation at the multiplexed input signal entering the node of Tsushima et al, in order to compensate for wavelength dispersion accumulated in the network, as taught by Seto. Tsushima et al. in view of Seto do not disclose means for monitoring before and after the photonic switch fabric, or means for protecting channels responsive to the monitoring means. Fukashiro et al. disclose a photonic node comprising means for performance monitoring on each one of a plurality of channels of the optical signal (fig. 11 and col. 13, lines 36-50) and means for protecting channels responsive to the monitoring means (fig. 4 and col. 7, lines 4-41; and fig. 11 and col. 13, line 51 to col. 14, line 10). It would have been obvious to one skilled in the art at the time of the invention to use the optical cross-connect disclosed by Fukashiro et al., as the optical crossconnect of the optical node of Tshusima et al., to provide the benefits of signal protection switching and individual signal performance monitoring for the individual signal channels, as taught by Fukashiro et al. Also, Tsushima et al. in view of Seto and further in view of Fukashiro et al. do not disclose means for

performing impairment compensation on each one of the plurality of channels of the optical signal responsive to the performance monitoring of each channel. Caspar disclose individual channel variable attenuators in an optical crossconnect node, placed after the crossconnect and before remultiplexing of the signal adjusted based on performance monitoring (fig. 3(a) and page 1479 col. 1, Section I and Section II, lines 1-20). It would have been obvious to one of ordinary skill in the art at the time of the invention to add individual channel variable attenuators after the crossconnect and before being remultiplexed by the multiplexer disclosed by Tshusima et al., in order to provide the benefit of equalizing the levels of the individual channels based on performance monitoring information for each channel before transmitting the multiplexed signal out of the node.

Regarding claim 2, the combination of Tsushima et al., Seto, Fukashiro et al. and Caspar disclose that the photonic switch fabric includes a plurality of optical switch planes, including switching groups of wavelengths (Tsushima et al.: fig. 14 and 15 and col. 13, line 36 to col. 14, line 11) as well as individual demultiplexed wavelengths (Tsushima et al.: fig. 16 and col. 14, lines 12-34).

Regarding claim 3, the combination of Tsushima et al., Seto, Fukashiro et al. and Caspar disclose that the means for demultiplexing includes a 1:M demultiplexer (Tsushima et al.: fig. 16, element 201).

Regarding claim 11, the combination of Tsushima et al., Seto, Fukashiro et al. and Caspar disclose means for monitoring including channel performance monitors (Fukashiro et al.: fig. 11, elements 24 and col. 13, lines 36-50).

Regarding claim 12, the combination of Tsushima et al., Seto, Fukashiro et al. and Caspar disclose that the means for multiplexing includes an M:1 multiplexer (Tshushima et al.: fig. 16, element 202).

4. Claims 13, 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Seto (US Patent No. 5937116) in view of Fukashiro et al. (US Patent No. 6362905) and further in view of Caspar et al. ("Four-channel 10-Gb/s transmission over 15-wavelength selective crossconnect paths and 1175-km dispersion compensated standard single-mode-fiber links"; Caspar et al.; Photonics Technology Letters, IEEE, Vol 10, Issue 10, Oct 1998, Pages 1479-1480).

Regarding claim 13, Seto disclose a photonic crossconnect node and means for reducing a variance between inputs of an optical signal received at a photonic node by applying bulk compensation to all channels of the optical signal (fig. 18 and col. 18, line 63 to col. 19, line 13), but do not disclose performance monitoring on each one of a plurality of channels of the optical signal. Fukashiro et al. disclose a photonic node comprising means for performance monitoring on each one of a plurality of channels of the optical signal (fig. 11 and col. 13, lines 36-50) and means for protecting channels responsive to the monitoring means (fig. 4 and col. 7, lines 4-41; and fig. 11 and col. 13, line 51 to col. 14, line 10). It would have been obvious to one skilled in the art at the time of the invention to use the optical cross-connect disclosed by Fukashiro et al., as the optical crossconnect of the optical node of Seto, to provide the benefits of signal protection switching and individual signal performance monitoring for the individual signal channels, as taught by Fukashiro et al. Also, Seto in view of Fukashiro et al. do not disclose means for performing impairment compensation on each one of the plurality of channels of the optical signal responsive to the performance monitoring of each channel. Caspar disclose individual channel variable attenuators in an optical crossconnect node, placed after the crossconnect and before remultiplexing of the signal adjusted based on performance monitoring (fig. 3(a) and page 1479 col. 1, Section I and Section II, lines 1-20). It would have

been obvious to one of ordinary skill in the art at the time of the invention to add individual channel variable attenuators after the crossconnect and before being remultiplexed by the multiplexer disclosed by Seto, in order to provide the benefit of equalizing the levels of the individual channels based on performance monitoring information for each channel before transmitting the multiplexed signal out of the node.

Regarding claim 16, the combination of Seto, Fukashiro et al., and Caspar disclose that the means for monitoring include means for detecting and isolating photonic node specific faults and mis-connects, and means for triggering protection switching to redundant modules when appropriate (Fukashiro et al.: col. 7, lines 4-41; and col. 13, line 51 to col. 14, line 10).

Regarding claim 17, the combination of Seto, Fukashiro et al., and Caspar disclose that the means for monitoring includes photonic node output channel power level compensation responsive thereto (Fukashiro et al.: fig. 4 and col. 7, lines 4-41; col. 1, line 64 to col. 2, line 12; and col. 2, lines 29-39).

5. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tsushima et al. in view of Seto, and further in view Fukashiro et al. and further in view of Caspar as applied to claims 1-3 and 11-12 above, and further in view of Harley et al. (US Patent No. 6323978).

Regarding claim 10, the combination of Tsushima et al., Seto, Fukashiro et al. and Caspar disclose a means for monitoring and optical protection, but do not disclose that the means for monitoring includes wrapper readers. Harley et al. disclose an optical channel overhead, used as a communication channel for optical protection or for remote monitoring between transmitters and receivers (col. 1, lines 12-42), and an optoelectronic converter for detecting an optical signal having an embedded control signal and demodulating the control signal to produce control information (col. 3, lines 26-39). It would have been obvious to one

skilled in the art at the time of the invention to use optical channel overheads as disclosed by Harley et al., in the system of the combination of Tsushima et al., Seto, Fukashiro et al. and Caspar, for end-to-end channel monitoring and controlling channel routing.

6. Claims 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Seto in view of Fukashiro et al. and further in view of Caspar, as applied to claims 13, 16 and 17 above, and further in view of Tsushima et al. (US Patent No. 6424445).

Regarding claim 14 and 15, the combination of Seto, Fukashiro et al. and Caspar disclose monitoring in the optical cross-connect used to control protection switching (Fukashiro et al.: col. 7, lines 4-41; and col. 13, line 51 to col. 14, line 10), but do not disclose a supervisory channel used for communicating between nodes and for controlling the optical cross-connects. Tsushima et al. disclose an optical node where a supervisory channel is used for communicating between nodes and for controlling the optical cross-connects (Tsushima et al.: abstract and col. 1, lines 14-35). It would have been obvious to one of ordinary skill in the art at the time of the invention to use a supervisory channel, as disclosed by Tshushima et al., between multiple nodes of the combination of Seto, Fukashiro et al. and Caspar, to communicate monitoring and control information between nodes for network wide performance and fault management, and the triggering of network wide protection and restoration.

7. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Seto in view of Fukashiro et al. and further in view of Caspar, as applied to claims 13, 16 and 17 above, and further in view of Essiambre (US Patent No. 6583907).

Regarding claim 18, the combination of Seto, Fukashiro et al. and Caspar disclose an optical node with means for monitoring the node output channels (Fukashiro et al.: fig. 11,

element 24), but do not disclose that the monitoring includes photonic node output channel dispersion compensation. Essiambre discloses adjustable dispersion compensation fiber gratings in a multichannel system where the dispersion is selected on a per-channel basis (abstract, col. 6, lines 24-38; and col. 7, lines 27-33), and where selecting the adjustable dispersion amount on a per-channel basis inherently requires monitoring the per-channel dispersion characteristics. It would have been obvious to one skilled in the art at the time of the invention to add adjustable dispersion compensation and dispersion monitoring on a per-channel basis to the node output channel monitoring of the combination of Seto, Fukashiro et al. and Caspar, to achieve optical system performance, where the different channels have different dispersion amounts.

8. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Seto in view of Fukashiro et al. and further in view of Caspar, as applied to claims 13, 16 and 17 above, and further in view of Chaudhuri et al. (US Patent No. 6587235).

Regarding claim 19, the combination of Seto, Fukashiro et al. and Caspar disclose a node with an optical cross-connect, but do not disclose means for interfacing with electrical signaling network nodes. Chaudhuri et al. disclose a node with an optical cross-connect, including interfaces with electrical signals using electrical-to-optical conversion (fig. 5; col. 5, lines 22-36). It would have been obvious to one skilled in the art at the time of the invention to use electrical-to-optical conversion disclosed by Chaudhuri et al., in the node of the combination of Seto, Fukashiro et al. and Caspar, in order to interface with electrical signals in addition to optical signals.

Response to Arguments

9. Applicant's arguments with respect to claims 1 and 13 have been considered but are moot in view of the new ground(s) of rejection.

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Conclusion

11. Any inquiry concerning this communication from the examiner should be directed to N. Curs whose telephone number is (571) 272-3028. The examiner can normally be reached M-F (from 9 AM to 5 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan, can be reached at (571) 272-3022. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306. Any inquiry of

a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571) 272-2600.

M. R. Sedighian

M. R. SEDIGHIAN
PRIMARY EXAMINER